What is claimed is:

1. A microcatheter, comprising:

an elongate shaft having a distal end and a proximal end, with a lumen extending therebetween;

a guidewire port disposed proximal of the distal end of the elongate shaft providing fluid communication with the lumen; and

a control valve overlying the guidewire port and exterior to the lumen;

wherein the control valve is configured to allow passage of a guidewire therethrough and forms a substantially fluid tight seal when the guidewire is removed.

2. The microcatheter of claim 1, wherein the control valve comprises a polymer sheath overlaying the guidewire port and includes a slit through the wall thereof in fluid communication with the guidewire port and lumen.

3. The microcatheter of claim 1, wherein the control valve is configured such that fluid pressure in the lumen biases the control valve to assist in forming a substantially fluid tight seal.

4. The microcatheter of claim 1, wherein the control valve comprises a polymer sheath configured to fit over the elongate shaft and includes an angled slit that extends through the polymer sheath with at least a portion of the slit positioned over the guidewire port.

5. The microcatheter of claim 4, wherein the angled slit extends radially through the polymer sheath at an angle relative to a radial line through the center of the lumen.

6. The microcatheter of claim 1, wherein the control valve is configured to assist device passage through the lumen when a guidewire is removed from the lumen.

7. The microcatheter of claim 6, wherein the device comprises a stent or a coil.

8. The microcatheter of claim 1, wherein the guidewire port comprises a substantially round aperture about 0.016 inches in diameter.

9. The microcatheter of claim 4, wherein the angled slit of the polymer sheath comprises an elongated slot having a length of about 0.24 inches and a width of about 0.002 inches.

10. The microcatheter of claim 4, wherein the angled slit is sized to permit passage of a guidewire sheath.

11. The microcatheter of claim 4, wherein the angled slit is less than about 0.24 inches in length.

12. The microcatheter of claim 1, wherein the elongate shaft comprises an inner polymer layer and an outer polymer layer disposed over the inner polymer layer, where the guidewire port comprises an aperture in the inner polymer layer and the control valve comprises an angled slit in the outer polymer layer.

13. A single lumen microcatheter, comprising:

an elongate shaft having a distal end and a proximal end, the elongate shaft having an outer surface and an inner surface, the inner surface defining a lumen extending through the elongate shaft;

a guidewire port positioned proximal of the distal end of the elongate shaft, the guidewire port extending from the inner surface of the elongate shaft to the outer surface of the elongate shaft; and

a polymer sheath disposed over the guidewire port, the polymer sheath having an inner surface and an outer surface, the polymer sheath including a passage in communication with the guidewire port, wherein the passage is configured to permit guidewire access through the guidewire port while remaining substantially fluid tight in use when no guidewire is provided through the passage.

14. The single lumen microcatheter of claim 13, wherein the passage comprises an angled slit.

15. The single lumen microcatheter of claim 14, wherein the angled slit extends radially through the polymer sheath at an angle relative to a radial line through the center of the lumen.

16. The single lumen microcatheter of claim 14, wherein the angled slit extends from the outer surface of the polymer sheath to the inner surface of the polymer sheath.

17. The single lumen microcatheter of claim 14, wherein the angled slit is configured to accept both a guidewire and a sheath wherein the sheath is configured to accept the guidewire therein.

18. A method of delivering a therapeutic element through a single lumen microcatheter, the single lumen microcatheter comprising an elongate shaft, a guidewire port, and a control valve disposed proximate the guidewire port, the method comprising:

advancing a guidewire sheath through the control valve and through the guidewire port;

advancing a guidewire through the guidewire sheath;

advancing the microcatheter over the guidewire to a treatment site;

removing the guidewire and the guidewire sheath, thereby closing the guidewire port; and

advancing the therapeutic element through the shaft, past the closed guidewire port, to the treatment site.

19. The method of claim 18, wherein the therapeutic element comprises embolic fluid.

20. The method of claim 18, wherein the therapeutic element comprises a mechanical device selected from the group consisting of stents, embolic coils, or other embolic material.